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1 UNITED STATES PATENT AND TRADEMARK OFFICE
 2 BEFORE THE PATENT TRIAL AND APPEAL BOARD

3

4 AKERMIN, INC.
 5 Petitioner
 6 vs.
 7 CO2 SOLUTIONS, INC.
 8 Patent Owner
 9 Case No. IPR 2015-00880
 10 Patent No. 8,329,458

11

12 THE DEPOSITION OF LOUIS J.
 13 DEFILIPPI, PH.D., taken at the offices of
 14 Marshall Gerstin Borun, LLP, taken before Janice
 15 M. Kocek, CSR, CLR, Notary Public and Certified
 16 Shorthand Reporter of said State, taken at Willis
 17 Tower, 233 South Wacker Drive, Suite 6300,
 18 Chicago, Illinois, on the 2nd day of December,
 19 2015, at the hour of 9:00 o'clock a.m.
 20
 21
 22
 23
 24
 25

Page 2

1 APPEARANCES:
 2 SENNIGER POWERS LLP
 3 BY: MR. MARC W. VANDER TUIG
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 9 Representing Akermin, Inc.;
 10 MARSHALL GERSTEIN BORUN LLP
 11 BY: MR. MICHAEL R. WEINER
 12 MR. SANDIP H. PATEL
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 19 Representing CO2 Solutions, Inc.
 20 ALSO PRESENT:
 21 Ms. Tina M. Ortman
 22 Marshall Gerstein Borun LLP
 23 Litigation Paralegal Manager

24 Court Reporter: Janice M. Kocek, CSR, CLR
 25

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 5 By Mr. Vander Tuig 157
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7 DEPOSITION EXHIBITS

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11 Exhibit 1004	United States Patent 4,602,987	64
12 Exhibit 1005	United States Patent 4,427,416	94
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14 Exhibit 1006	"Batch Absorption of CO2 by Free and Micoencapsulated Carbonic Anhydrase"	150
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1 (Witness sworn.)
 2 LOUIS J. DEFILIPPI, Ph.D.,
 3 called as a witness herein, having been first
 4 duly sworn, was examined and testified as
 5 follows:
 6 EXAMINATION
 7 BY MR. WEINER:
 8 **Q. Good morning, Dr. DeFilippi. My name is Michael Weiner. I represent CO2 Solutions in an IPR proceeding before the U.S. Patent and Trademark Office, Patent Trial and Appeal Board.**
 9
 10 **Would you state your name, please, for the record.**
 11
 12 A. Full name is Louis J. DeFilippi.
 13 (Exhibit 1003 was marked for identification.)
 14
 15 BY MR. WEINER:
 16 **Q. Dr. DeFilippi, I'd like to hand you copy of what's been marked Exhibit 1003. I have a copy for counsel.**
 17
 18 **Do you recognize this that document?**
 19
 20 A. Yes, I believe I do.
 21
 22 **Q. Do you recognize this document as**
 23
 24
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 11 8,329,458 B2
 12 Exhibit 1003 Declaration of 4
 13 Dr. Louis DeFilippi
 14 Exhibit 1004 United States Patent 64
 15 4,602,987
 16 Exhibit 1005 United States Patent 94
 17 4,427,416
 18 Exhibit 1006 "Batch Absorption of 150
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 23 in Sol-Gel Silica Glass on
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 and Unfolding of Bovine
 Carbonic Anhydrase II"
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 English Dictionary"
 (excerpt)
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 6 EXAMINATION
 7 BY MR. WEINER:
 8 **Q. Good morning, Dr. DeFilippi. My**
 9 **name is Michael Weiner. I represent CO2**
 10 **Solutions in an IPR proceeding before the U.S.**
 11 **Patent and Trademark Office, Patent Trial and**
 12 **Appeal Board.**
 13 **Would you state your name, please,**
 14 **for the record.**
 15 A. Full name is Louis J. DeFilippi.
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 17 identification.)
 18 BY MR. WEINER:
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 20 **you copy of what's been marked Exhibit 1003. I**
 21 **have a copy for counsel.**
 22 **Do you recognize this that**
 23 **document?**
 24 A. Yes, I believe I do.
 25 **Q. Do you recognize this document as**

Page 5

1 **the declaration you provided for Akermin, Inc.,**
2 **in connection with the IPR proceeding that I**
3 **referred to?**
4 A. I believe that's correct, yes.
5 **Q. Dr. DeFilippi, have you ever had**
6 **your deposition taken before?**
7 A. Yes, I have.
8 **Q. And how many times have you had**
9 **your deposition taken?**
10 A. I didn't look it up, but somewhere
11 in the neighborhood of four, five, six.
12 **Q. Have you ever had a deposition**
13 **taken in connection with a Patent Office**
14 **proceeding?**
15 A. Yes, but I, I believe it was
16 before the inter partes review. It was a patent
17 infringement case.
18 **Q. So that was probably before a**
19 **district court, a patent infringement matter?**
20 A. Well, I presented it under
21 conditions similar to this. So there was no --
22 it wasn't a court proceeding directly.
23 **Q. I understand. So you understand**
24 **that you're testifying under oath today?**
25 A. Yes.

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1 **Q. And you understand that the court**
2 **reporter will be taking down all the questions**
3 **and answers today?**
4 A. Yes.
5 **Q. Is there anything you're aware of**
6 **that would interfere with your ability to testify**
7 **completely and truthfully today?**
8 A. No.
9 **Q. If at any time you need to take a**
10 **break today during the deposition, just let me**
11 **know and we'll accommodate that. The only**
12 **exception will be if there's a question pending,**
13 **we try to complete that before we take a break.**
14 A. Sure.
15 **Q. Do you understand that the Patent**
16 **Office rules prohibit you from discussing your**
17 **testimony with your counsel until after the**
18 **cross-examination deposition is completed?**
19 A. Yes.
20 **Q. I know you covered this in your**
21 **declaration, but could you briefly describe your**
22 **educational background?**
23 A. Bachelor -- BA, Bachelor of Arts,
24 in chemistry with honors from Queens college,
25 City University of New York, 1971. Graduate work

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1 was at the University of Michigan. There are a
2 couple of extraneous degrees in think which
3 really don't count. A master's degree was just a
4 formality.
5 So the Ph.D. was granted in
6 January of 1976. And then postdoctoral work at
7 Michigan for a few months and then in July at
8 Cornell University in Ithaca for two years in the
9 laboratory of Quentin Gibson.
10 **Q. And after your postdoc, you went**
11 **to work for ULP?**
12 A. Exactly, yes.
13 **Q. Can you briefly describe what kind**
14 **of work you did for ULP?**
15 A. Yes. They brought me in to work
16 with immobilized enzymes, because they were big
17 in immobilized catalysts, and they wanted to then
18 move into biological catalysts. So I was in a
19 program with them to develop commercial products
20 involving immobilized enzymes.
21 **Q. Generally, what types of products**
22 **were you trying to develop there?**
23 A. This was immobilized glucose
24 isomerase, and it actually did go commercial to
25 make high fructose corn syrup. Now that's a

Page 8

1 dirty word. Back then it was nice. And other
2 enzymes, of course, but that was the main one.
3 **Q. Did you ever do any work for them**
4 **involving carbonic anhydrase?**
5 A. Not at ULP, no.
6 **Q. You did work with carbonic**
7 **anhydrase at a later time?**
8 A. Well, I had to become familiar
9 with carbonic anhydrase in graduate school
10 because I was working with heme proteins and
11 metalloproteins and red cells. And besides
12 hemoglobin, the obvious, carbonic anhydrase is
13 one of the major enzymes in the red blood cell.
14 And then at a later date, when I
15 was consulting at ThermoGen, I helped some of the
16 business development and scientists there put
17 together a proposal involving CO2 sequestration
18 involving carbonic anhydrase -- immobilized
19 carbonic anhydrase.
20 **Q. When was that work at ThermoGen?**
21 A. ThermoGen, I'm just going to give
22 you rough times, was around -- I'm going to say
23 1999 to 2000 when I started.
24 **Q. So that was -- after you left ULP,**
25 **you went to ThermoGen?**

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1 A. Well, no. I was -- after ULP,
 2 there were -- I tell people I worked for six
 3 companies but never moved my desk. There were
 4 all these mergers and divestitures. I ended up
 5 with Allied Signal. And Allied Signal is the
 6 company that I left.

7 I was laid off in 1995. Then they
 8 hired me back in 1996, then laid me off again in
 9 1997, then offered to hire me back again around
 10 2007. I turned them down on the third time.
 11 So...and then outside of that, I was consulting,
 12 independent consulting.

13 **Q. How long were you with ThermoGen?**
 14 A. Well, I was consulting with them,
 15 not an employee.

16 **Q. I see.**
 17 A. Again, I was with ThermoGen,
 18 MediChem, and DeCode Genetics. MediChem bought
 19 out ThermoGen. DeCode bought out MediChem. So,
 20 again, I'm -- I had the same desk.

21 **Q. You went through a lot of**
 22 **corporate changes?**
 23 A. Three different companies. Yeah,
 24 and I, I -- if I remember right, around 2003 is
 25 when I stopped consulting for that group of

Page 10

1 companies.

2 **Q. When you did the work for**
 3 **ThermoGen on CO2 sequestration, what kind of**
 4 **technology were you using for that sequestration?**
 5 A. Immobilized enzymes in a reactor,
 6 in an immobilized enzyme reactor.

7 **Q. With carbonic anhydrase?**
 8 A. Yes.

9 **Q. And was that with a triphasic**
 10 **reactor?**
 11 A. It would have to be. It would
 12 have to be, because you have the gaseous phase,
 13 carbon dioxide. You have the solid immobilized
 14 enzyme and then the aqueous phase. So it would
 15 have to be three phases.

16 **Q. And that was around 1999 or 2000**
 17 **when you began?**
 18 A. Exactly, yes.

19 **Q. Was that the first time you did**
 20 **work for the triphasic reactor?**
 21 A. I worked with triphasic reactors a
 22 number of times previously but not with a
 23 suspended bed. I worked mostly with a packed
 24 bed, if you understand the difference.

25 **Q. Okay. Well, can you explain what**

Page 11

1 **you mean by a packed bed?**
 2 A. Packed bed, the bottom line is
 3 that the support is not moving. It's, it's held
 4 in place in a reactor.

5 **Q. And by "support," are you**
 6 **referring to what the catalyst is attached to?**
 7 A. Exactly. Some people call that
 8 the substrate, and I don't like using that term
 9 because the substrate is the molecule that the
 10 enzyme acts on, and it's a great way to be
 11 confusing. I can call it substratum to
 12 differentiate from substrate. But I don't.
 13 Otherwise, it's just confusing.

14 **Q. So in connection with CO2**
 15 **sequestration, you refer to CO2 as the substrate?**
 16 A. That would be one of the
 17 substrates.

18 **Q. And you refer to -- but**
 19 **sometimes -- it's referred to in documents that**
 20 **have come up in this case. But sometimes it's**
 21 **been referred to as a substrate. You generally**
 22 **refer to that as a support for what --**
 23 A. Either a support or substratum.
 24 Usually support. Otherwise, it's confusing.

25 **Q. Prior to this engagement, have you**

Page 12

1 **ever done any work for Akermis, Inc.?**
 2 A. No.

3 **Q. Referring to your declaration**
 4 **that's been handed to you before, Exhibit 1003,**
 5 **are you aware of any errors that should be**
 6 **corrected in your testimony?**
 7 A. I do not believe there are any or
 8 not that I'm aware of.

9 **Q. Are you aware of any information**
 10 **that may be inconsistent with views expressed in**
 11 **your declaration?**
 12 A. No.

13 **Q. In paragraph 6 of your deposition**
 14 **--**
 15 A. To which page are you referring?
 16 I got it. Page 7 in the lower right.

17 **Q. We're at page 7. So there's two**
 18 **different sets of numbering on here. There's**
 19 **page 7 that's in the lower right-hand corner,**
 20 **paragraph 6.**
 21 A. Right.

22 **Q. You refer to a number of documents**
 23 **that you reviewed in preparing your declaration;**
 24 **is that correct?**
 25 A. Yes.

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1 **Q. Other than the items listed there,**
2 **is there anything else that you reviewed in**
3 **preparing your declaration?**
4 A. Nothing that I based my opinion
5 on. Of course, you look at a number of other
6 things, which I didn't see as being necessary to
7 refer to. It didn't change my opinion. It
8 didn't improve it or disprove it.
9 **Q. Nothing you reviewed that was**
10 **inconsistent with your opinions?**
11 A. Yes. Correct.
12 **Q. Now, paragraph 6 says that you**
13 **reviewed a number of things. And in the second**
14 **line of paragraph 6, it says you reviewed**
15 **Exhibits 1004 to 1015, correct?**
16 A. That's what it states, yes.
17 **Q. Did you realize your declaration**
18 **actually refers to some additional exhibits**
19 **numbered 1016 to 1020?**
20 A. I do know that. As a matter of
21 fact, I found two that were 1018s in my files,
22 yes. So I'm assuming one is a 1018 and one is a
23 1019.
24 **Q. Now, your declaration refers up**
25 **through Exhibit 1020.**

Page 14

1 A. Does it? All right.
2 **Q. So I'm assuming you reviewed those**
3 **as well in addition to 1004 to 1015?**
4 A. I'd have to see them to confirm
5 that.
6 **Q. Okay. We may have some questions**
7 **on those specific exhibits and we can kind of**
8 **hold those until later.**
9 A. Good.
10 (Exhibit 1001 was marked for
11 identification.)
12 BY MR. WEINER:
13 **Q. Let me give another exhibit to**
14 **you. This is what has been marked as 1001. Do**
15 **you recognize 1001?**
16 A. Yes. This is what I've been
17 referring to as the '458 patent.
18 **Q. You understand this is the patent**
19 **that's being reviewed by the Patent Office in the**
20 **IPR proceeding?**
21 A. Yes, that's my understanding.
22 **Q. Prior to being engaged for this**
23 **matter by Akermin, were you familiar with the**
24 **'458 patent?**
25 A. I was not.

Page 15

1 **Q. Are you familiar with Carmen**
2 **Parent -- I probably didn't get the right French**
3 **pronunciation on that -- or the other listed**
4 **inventor of the '458 patent?**
5 A. Carmen Parent.
6 **Q. That sounds better.**
7 A. Too many years of French. I'm not
8 familiar with them. Frédéric Dutil from Quebec,
9 no.
10 **Q. I'd like to direct your attention**
11 **to paragraph 43 of your declaration. That's page**
12 **24 in the lower right-hand corner.**
13 A. Got it. Yes.
14 **Q. Now, paragraph 43 states that "a**
15 **person of ordinary skill in the art at the time**
16 **of the alleged invention of the '458 patent would**
17 **have had at least a Bachelor of Science degree in**
18 **chemical engineering, chemistry or biochemistry,**
19 **and at least five years' experience in research**
20 **or development in fields or industries pertinent**
21 **to the art (e.g. immobilized biocatalysis.)"**
22 **Did I read that correctly?**
23 A. I believe you did.
24 **Q. How did you come up with this**
25 **statement of the level of skill in the art?**

Page 16

1 A. I've used similar or it has been
2 used similar to this for other programs I've been
3 on, other projects where I've been deposed. I've
4 seen the other parties use that. So it's just a
5 general set of -- or a general level of
6 experience.
7 **Q. And you understand that, in the**
8 **context of patent law, that the person of**
9 **ordinary skill in the art is the perspective from**
10 **which a number of things were evaluated,**
11 **including what would be understood in a**
12 **reference?**
13 A. Yes.
14 **Q. And you understand that that's the**
15 **perspective that's relevant for interpreting the**
16 **language of patent claims as well, right?**
17 A. Yes.
18 **Q. In that statement in paragraph 43,**
19 **what did you mean by "fields or industries**
20 **pertinent to the art"?**
21 A. Anything involving, for example,
22 processes that employ biological catalysts.
23 **Q. In your view, is experience in**
24 **immobilized biocatalysis required for a person to**
25 **have ordinary skill?**

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